of a different objective environment, all differing from that of man. But the environment is believed by evolutionists to be a very important element in the development of mind. If, however, the environment is the product of mind, there has been no antecedent environment, as understood by evolutionists. These two absurdities must prevent any consistent biologist from being an idealist in the Berkeleyan sense. The services of evolution in explaining the so-called innate ideas have been shown by Spencer to be very great. Innate ideas are seen to be inherited ideas, or the function of inherited structure; but as evolution requires also acquired ideas, the field of controversy between the intuitional and experiential theories is narrowed to these. Evolution stands on the experiential ground; not but that there is some axiomatic truth which the developed human mind is able to grasp without more experience than that necessary to a statement of the proposition; but without evolution by experience, man would never have acquired the power necessary to do this. —*E. D. Cope.*

MICROSCOPY.[1]

O. Schultze's Method of preparing the Amphibian Egg.[2]— For hardening-fluids the following mixtures were found to give perfectly satisfactory preparations, when used in the manner described below:

1. *Chrom-osmio-acetic Acid.*

Chromic acid (1%)	25 parts.
Osmic " "	10 "
Water	60 "
Acetic acid (2%)	5 "

2. *Chrom-acetic Acid.*

Chromic acid (1%)	25 parts.
Acetic " (2 ")	5 "
Water	70 "

The eggs are left in one of these fluids twenty-four hours, then washed in distilled water, which should be often changed. The egg-envelopes are next removed by the aid of needles, and the eggs are then ready for surface-study.

For the purpose of sectioning the eggs are transferred from the water used in washing to 50% alcohol, then to 70%, 85%, and 95%, leaving them twenty-four hours in each grade. The last grade should be changed several times. The eggs are then clarified in turpentine one to two hours, and then placed in paraffine that melts at 50° C. for one-half to one hour.

[1] Edited by C. O. WHITMAN, Ph.D., Milwaukee, Wisconsin.
[2] O. Schultze, Zeitschr. f. wiss. Zool., xlv., H. 2, p. 185, April, 1887.

Schultze states that the success of the method depends on following precisely the directions given as to time. If the eggs remain longer, either in alcohol, turpentine, or paraffine, the results may be entirely unsatisfactory. If the conditions are strictly followed the eggs have the consistency of the paraffine, and cut excellently without crumbling in sections $\frac{1}{200}$ mm. thick.

For staining borax-carmine was used, directly after washing, twenty-four hours. The eggs were next placed in acid alcohol of seventy per cent. (five drops of the pure acid to 100 ccm. of the alcohol) to remove a part of the color.

The first hardening fluid does not penetrate well, and is not well adapted for fixing the central parts of the egg.

Baskets for the Suspension of Objects in Paraffine.—Mr. H. Garman recommends the use of wire baskets for suspending objects in paraffine. Such a basket is easily made by coiling

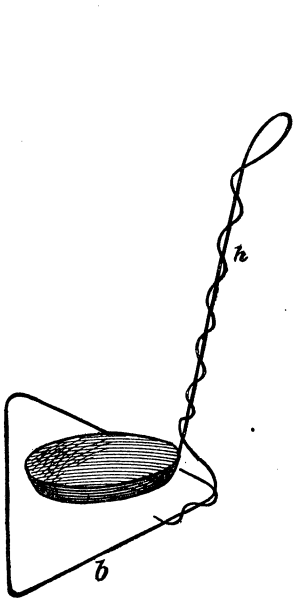


FIG. 1.

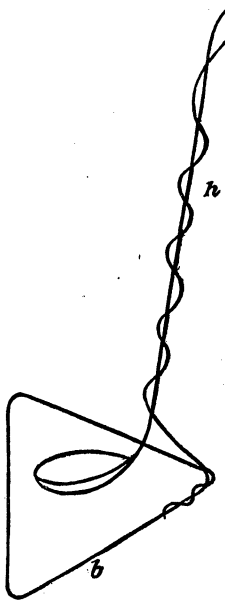


FIG. 2.

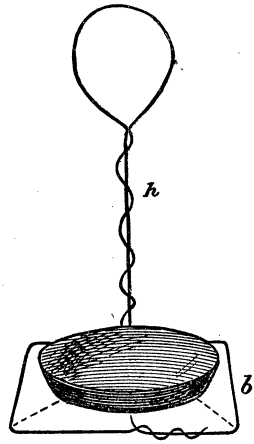


FIG. 3.

annealed wire as shown in Fig. 1, beginning at the centre of the bottom, and working outwards to the margin, then making the handle (*h*), and finishing with a triangular base (*b*). In use it is placed in the melted paraffine, the triangular base supporting and keeping it from the bottom of the paraffine basin; and it can be removed by means of the projecting handle, which is made of such length that it does not interfere with the glass

cover of the basin. For very small objects a hammered-wire spoon, like that used by Dr. Mark, is mounted in the same way as the basket (Fig. 2). This method of suspending objects in paraffine has resulted from attempts to avoid long handles, or other belongings of the baskets, that prevent the close fitting of the plates of glass used to cover the paraffine dishes.

A New Section-Smoother.[1]—Dr. P. F. Mall recommends a section-smoother constructed on the following principle. It consists of a rubber rod, about 1 ¼ cm. in diameter, which rotates *loosely* on a solid axis. The rod is so placed that it hangs a little below and in front of the edge of the knife (Fig. 1). When the

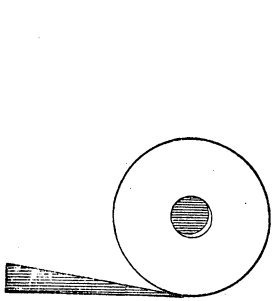


FIG. 1.

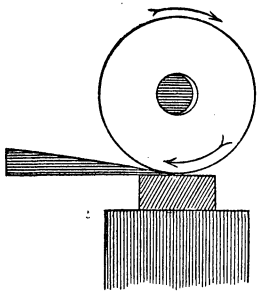


FIG. 2.

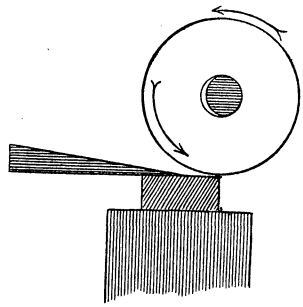


FIG. 3.

knife passes over the object the rod is raised to an extent equal to the thickness of the section, and is thrown above and a little behind the edge of the knife (Fig. 2), so that the section is prevented from rolling as it slides upon the knife. When the knife is shoved back preparatory to making the next section the rod rolls over the preparation, and, in consequence of the play of its axis, is kept free from edge of the knife. The section does not stick to the rod, as is the case in Jung's section-smoother.

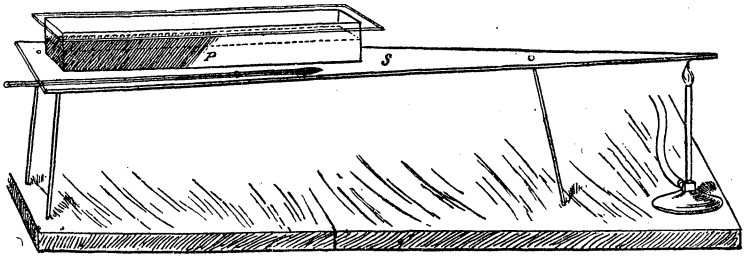
A New Paraffine Imbedding Apparatus.—Those who have had much experience in imbedding in paraffine are aware of the difficulties and risks which attend the imbedding of delicate objects on account of the danger of overheating the imbedding mass. The trouble with thermostats, or heat-regulators, is that they get out of order and give trouble, aside from the difficulty which arises from the variations in the pressure of the gas in the pipes which supply the burners, and which is entirely beyond the control of most forms of the thermostat.

To avoid this, Dr. C. S. Dolley, of the Biological Department of the University of Pennsylvania, began a series of experiments

[1] Archiv f. Anat. u. Physiol. Anat. Abth., 1887, H. 1, p. 3.

with copper bars, which were heated at one end by means of a Bunsen burner, so that the heat conveyed by conduction to the remote end of the bars gradually diminished in intensity because of its being constantly radiated into the surrounding air, according to well-known laws stated in the text-books on physics. It was found that, with the room at an approximately constant temperature, there was a point along the bar, at a certain constant distance from its heated end, where the temperature of 55° C. could be maintained, and where, if there was placed a copper cup filled with hard paraffine, the latter could be kept just at the point of fusion for a long time without endangering the objects to be imbedded. These results showed that it was possible to utilize an apparatus of this type for imbedding purposes.

This led the writer of this to begin a set of experiments with a very simple modification of the foregoing type of apparatus,



with the object of getting rid of the usual water-bath entirely in the process of imbedding, and to also use the paraffine itself as a means to indicate how far away from the source of heat it would be safe to allow an object to remain while it was being saturated.

This object was effected in the following manner: A triangular sheet of copper, slightly less than one-sixteenth of an inch thick, eighteen inches long, and ten inches wide at one end and running to a sharp point at the other, as shown at *s* in the accompanying figure, is supported horizontally upon two legs at the wide end, and at some distance from the pointed end by another leg, these three legs constituting a firm tripod base for the whole device. Under the pointed end of the triangular plate of copper is placed a small Bunsen gas-burner, with an aperture of about one-eighth of an inch, and connected with the gas-supply of the building by means of a rubber tube. If the flame is allowed to burn steadily at about half its full force, and permitted to play upon the copper plate at a distance of about one inch from its extreme point, as shown in the figure, the whole plate will soon be heated, but the temperature will be found to gradually diminish towards the wide end. At a distance of about twelve to thirteen inches from the

point where the flame acts upon the copper plate the temperature will remain steadily at about 56° C. (133° F.), with the temperature of the room at 22° C., or 71° F. As long as the temperature of the room remains nearly the same the temperature of the plate at any given distance from the burner will also remain at the same point. This constancy is due to the fact that the heat which is conducted through the copper plate with constant rapidity from its source—the burner—is radiated into the surrounding air at an equally constant rate, and, as one passes towards the wide end of the plate from the burner, trials with the thermometer show that there may be found an infinite number of points in succession at which the temperature is very nearly constant.

In order to use the paraffine itself as an indicator of the proper temperature, and in that way dispense with a thermometer altogether, if desirable, it was necessary to use a new type of cup in which to melt the paraffine. The paraffine-cup or trough (P) shown in the figure is made of copper, tin-lined, and is six inches long, one and one-half inches wide, and one and one-fourth deep. In practice the cup is half filled with paraffine and placed lengthwise on the copper plate, with its narrowest side towards the flame and about nine inches from it, as shown in the cut. The paraffine-cup may be covered with a strip of glass to exclude dust. If the burner plays upon the plate as directed, and the trough is in the proper position, in about an hour it will be found that the paraffine in the trough has been melted at the end nearest the burner, but has remained congealed at the other. Moreover, it will be found that the point where the melted comes in contact with the nearly frozen paraffine is very constant, and it is just at this point where it is safe to place objects which are to be imbedded. The paraffine which remains congealed in the trough is represented in the cut by the shading at the remote end of the trough, the clear space below the dotted lines nearest the flame indicating the portion which remains molten.

It is clear, from what has preceded, that a shorter cup or trough filled with soft paraffine melting at 36° C. may be placed still farther away from the burner, alongside of the vessel containing hard paraffine fusing at 56° C., while mixtures of turpentine and paraffine or chloroform and paraffine would remain molten at a still greater distance from the flame.

The applications and possibilities of this new device will be readily appreciated by histologists and embryologists, since it can be quickly seen if objects are in danger from overheating by simply noting whether the point where the paraffine remains molten in the trough has advanced farther from the flame. This can be easily observed through the transparent cover of the trough.

For large laboratories, where a number of students are engaged in imbedding, a simple modification of this device suggests itself. For such a purpose a horizontal disk of sheet-copper, of the same thickness, but three feet in diameter, would afford room for a large number of paraffine imbedding-troughs, which could be arranged in a circle around and some distance from the centre, at which point a larger burner would be applied underneath. The temperature in such a device would diminish from the centre towards the periphery of the disk. The troughs would be placed upon different radii upon the surface of the disk, just as two or three troughs may be placed upon different radii of the triangular plate, which is practically the sector of a disk, as described above.

For imbedding delicate objects, small cups made of tin-foil, pressed into shape in circular, tapering moulds, may be satisfactorily employed with this apparatus, in the same way as the troughs.

The device described above can be made by any coppersmith for about two dollars.—*John A. Ryder.*

SCIENTIFIC NEWS.

—The Harvard Natural History Society this year celebrates the fiftieth anniversary of its foundation by a course of popular lectures on the Fauna of Massachusetts. The series embraces Birds, by Wm. Brewster; Reptiles, by Samuel Garman; Fishes, by Mr. Collins; Butterflies, by S. H. Scudder; Beetles, by Geo. Dimmock; Crustacea, by J. S. Kingsley; Spiders, by J. H. Emerton; Worms, by C. S. Minot; Cœlenterates, by S. F. Clarke; Sponges, by A. Hyatt; and others which have not yet been fully arranged for. The Harvard Natural History Society is second in age of college societies, and has embraced many of the prominent naturalists among its members. In times past it had collections and a library, but the specimens were long ago turned over to the Museum of Comparative Zoology, while the library of late years has grown but little, the University furnishing abundant facilities in this direction.

—Bernard Persh, late hospital steward at the Frankford Arsenal, near Philadelphia, died recently of typhoid pneumonia, at the age of thirty-seven. He was an enthusiastic microscopist, and had lately been conducting considerable investigations in bacteriology, and was very successful in photographing these organisms. Personally, he was a pleasant companion.